

REMARKS

Claims 46-64 are pending in the application. All claims stand rejected. Claims 46-55 stand rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement. Claims 46-64 also stand rejected under 35 U.S.C. §103 in view of various combinations of references. Each of these references will be discussed in detail below.

With regard to the rejection under §112, Applicants have amended claim 46 to more clearly identify the subject matter of the present invention and to resolve any apparent confusion over the use of the terms "composite film" and "laminated film". The present invention relates to a film resulting from a series (at least 3 to N) of stacked laminated films. Each of the individual laminated films are themselves multi-layered. Thus, each laminated film has a first film, a second film and a laminating adhesive or lacquer between the first and second films. The several laminated films, when stacked together, form a composite film. The composite film can then be used to protect a functional element such as a printed circuit board, a sensor, a metallic stranded wire, a metallic conductor, or some other type of electronic component. If, for example, the functional layer is a printed circuit board, then the composite film would sealingly engage one side of the printed circuit board. If the functional element is a metallic conductor, it may be desirable to have a composite film according to the present invention sealingly engage both sides of the metallic conductor to form a ribbon cable or the like. It is not necessary that the functional element be present between the individual films of the several laminated films, or even between each of the several laminated films. Rather, the resulting composite film comprising the stacked laminated films is what sealingly engages the printed circuit board or metallic conductor or electronic component.

Applicants submit that the claimed invention is adequately supported in the specification and would be readily understood by one of skill in the art in view of the specification. For example, page 7 of the English language translation describes

intended potential uses for the resulting composite film such as a protective cover or film for the manufacturer of flexible, printed conductors or a protective film for printed circuit boards. In such cases, the functional element would clearly be the conductors or the circuit boards themselves. In other words, one of skill in the art would understand that the functional element would not be interposed between the multi-layer laminate films but rather sealingly engage the resulting composite film. The claims directed toward sealingly engaging at least one side of a functional element are suggested and adequately described by the specification as filed.

With regard to the rejections under 35 U.S.C. §103, claims 46-48 stand rejected as being unpatentable over Nakahigashi, JP5-314824 (JP '824). According to the Office Action, JP '824 does not disclose a composite film comprising at least three to N multi-layered laminate films, nevertheless, it would have been obvious to one of skill in the art to provide at least three multi-layered laminate films. Applicants respectfully traverse the suggestion in the Office Action and request that the rejection be withdrawn for several reasons.

As an initial matter, no reason has been shown why one of skill in the art would modify the JP '824 reference as the Office Action proposes. The JP '824 reference is primarily concerned with providing a flat cable that can be repeatedly bent without cracking. Thus, it provides a metal foil sandwiched between two plastic films to form a complex tape. In contrast, the present invention is directed toward providing a halogen-free film which satisfies the requirements for high temperature resistance, low shrinkage, and excellent chemical resistance, particularly hydrolytic resistance. Because the present invention is directed toward solving a very different problem than the issue addressed by the JP '824 reference, the present invention discloses and claims a very different structure.

Prior to the present disclosure, no known films simultaneously satisfied the requirements for good hydrolytic resistance, excellent mechanical and chemical resistance, use at high long-term service temperatures, and good flame resistant properties, all provided by a halogen-free device. In order to meet these requirements,

Applicants have found that multiple laminated layers may be necessary to protect the functional element under consideration in a way which meets these specific requirements. Accordingly, each of the claims is directed toward a film having at least three to ten multi-layered laminate films forming the composite film. The JP '824 reference lacks any teaching or suggestion of the claimed composite film, it is only a dual-layer device. Moreover, given the disclosure of the JP '824 reference, one of ordinary skill in the art would not be motivated to modify the JP '824 reference as the Office Action proposes to arrive at the presently claimed invention. Accordingly, absent some teaching, suggestion or motivation to support the rejection of claims 46-48, the rejection should be withdrawn.

For similar reasons, the rejection of claims 49-64 under 35 U.S.C. §103 based upon the JP '824 reference in combination with other references, should be withdrawn because there is no motivation to combine these other references with the teachings of JP '824 to arrive at the presently claimed invention. Again, the JP '824 reference is directed toward singularly toward the issue of providing a flexible ribbon-like component. Response to the particular rejections in the Office Action follow.

With respect to claims 49-52 and 54, no reason can be shown why one of skill in the art would modify the JP '824 reference as the Office Action proposes to add a thermally activated substance. As disclosed on page 5 of the English language translation of the specification, the thermally activated substance improves the sealing characteristics of the composite film to the functional element. This is unrelated to the mechanical flexibility properties of the resulting device which is the primary concern of the JP '824 reference. Accordingly, the Applicants respectfully submit that the rejection depends upon the improper use of hindsight reconstruction to recreate the presently claimed combination of elements. The claims are not obvious from the prior art itself.

For similar reasons, the rejection of claims 53 and 56 in view of JP '824 and Hols, U.S. Patent No. 6,071,551 should be withdrawn. As noted in paragraph four of the Office Action, the JP '824 reference does not disclose anything regarding the wet

application weight of the laminated adhesive, and particularly not in the range as claimed by Applicants. The particular properties of the laminating adhesive claimed improve the moisture resistance of the resulting film. Also, the process step of drying the film as set forth in claim 56 improves the sealing and moisture characteristics of the resulting film. Applicants respectfully request that the rejection of claim 53 and 56 be withdrawn because no reason has been shown why one of ordinary skill in the art would modify the JP '824 reference as the Office Action proposes, particularly in view of the different objectives sought to be achieved by the JP '824 reference or Hols reference, and the present invention.

With regard to claim 55, Applicants submit that the combination of JP '824 and Escallier set forth in paragraph five of the Office Action, would not render obvious Applicants' claimed film because JP '824 or Escallier, either alone or in combination, do not disclose or suggest a halogen free composite film comprising at least 3 to N sealable, multi-layered laminate films.


With regard to the rejection of claims 57, 58, and 61 set forth at paragraph six of the Office Action, Applicants respectfully request that the rejection be withdrawn because the cited references, either alone or in combination, do not disclose or suggest a method for manufacturing the halogen free composite film having at least 3 to N sealable, multi-layered laminate films. No reason has been shown why one of skill in the art would modify the JP '824 reference in view of Hols or Hake as suggested in the Office Action. The JP '824 reference is primarily concerned with the mechanical flexibility of the resulting device. The particular compositions recited in claims 57-61 relate to improving the sealing characteristics of the resulting film, the thermal resistance, the chemical resistance or strength of the resulting device. One would not be motivated to combine these features with additional laminate films in the device of JP '824, because in most cases it would compromise the elasticity of the resulting device which is the primary concern of the JP '824 reference. The same argument applies to the rejection of claims 59, 60, and 62-64 set forth in paragraph seven of the Office Action.

In summary, the Applicants respectfully submit that the combination of JP '824 and any of the other cited references would not render obvious Applicants' claimed film and method because the cited references, either alone or in combination, do not disclose or suggest each and every limitation of the claimed film or method. In particular, a device having at least three laminated films (6 to 9 layers total) applied to each side of a functional element, would likely lack the desired repeated bendability characteristics sought by the JP '824 reference. Hence, the JP '824 reference actually teaches away from the numerous and varied layers and materials claimed in the present invention because it is directed toward solving a substantially different problem.

Accordingly, in view of the foregoing amendments and remarks, Applicants submit that claims 46-64 are allowable over the prior art of record. A Notice of Allowance indicating the same is therefore earnestly solicited. The Examiner is invited to telephone the Applicants' undersigned attorney at (248) 223-9500 if any unresolved matters remain.

Respectfully Submitted,

ARTZ & ARTZ, P.C.



Robert P. Renke, Reg. No. 40,783
28333 Telegraph Road, Suite 250
Southfield, MI 48034
(248) 223-9500

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